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What are they thinking? Consumer attitudes to meat production in Australia

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3

4 [What are they thinking? Consumer attitudes to meat production in](#)
5 [Australia](#)

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7

8 [Abstract](#)

9 Meat production has come under increasing scrutiny from consumers and citizens who feel
10 that certain practices are unethical and impact negatively on farm animal welfare. Animal
11 welfare can be viewed as both a scientific and social concept, and purchasing products with
12 animal welfare claims can be considered an act of “ethical consumption”. This paper reviews
13 research which examines consumers’ attitudes to animal welfare and highlights tensions
14 between consumer and citizen attitudes and behaviours, and assumptions that are made
15 within these studies. We present our own research into motivations to purchase free-range
16 eggs as an example of research that attempts to unpack these assumptions, in particular
17 that such purchases are made out of concern for animal welfare. We present a further
18 example of our own research that attempts to identify how attitudes to meat production
19 are socially constructed. We conclude with recommended strategies to engage the broader
20 community in discussions about animal production in order to improve industry-community
21 communication about farm animal welfare in meat production industries.

22

23 1.0 Introduction

24 The practice of raising animals for meat has come under increasing public scrutiny in recent
25 decades, particularly in western, developed societies where food is relatively plentiful. Most
26 of these concerns relate to what is broadly termed “animal welfare”; however it is becoming
27 clear that different actors within the food system think very differently about the meanings
28 associated with this term (Coleman *et al.* 2016; Dockès *et al.* 2006; Hansson and Lagerkvist
29 2012; Vanhonacker *et al.* 2008), and this difference in opinion has resulted in animal welfare
30 becoming a point of tension and debate. More recently, concerns about the impact of
31 animal production on the environment, and the sustainability of meat production, also have
32 been raised (Verbeke *et al.* 2010); however animal welfare continues to be the main ethical
33 issue for consumers and the community, at least with respect to the pork industry in
34 Australia, and thus is the focus in this paper.

35 The diversity of opinions about farm animal welfare among food system actors, changing
36 opinions among these actors over time, increasing scrutiny of food production methods
37 within the media (Phillipov 2016a), combined with ongoing and increasing demand for
38 affordable animal protein products presents challenges for livestock production. The
39 purpose of this paper is first to outline research into both community and consumer
40 attitudes to livestock production from a range of disciplines and across locales including
41 Australia, with particular focus on the assumptions about consumers that underpin this
42 research given the methodologies employed. Second, we present findings from our own
43 research (Bray and Ankeny 2017; Bray *et al.* 2016) which reveals how Australian consumers

44 think about animal welfare. Third, we suggest strategies for engaging the community in
45 discussions about farm animal production based on our findings and literature within the
46 scholarly field of public understanding of science.

47 **2.0 Background**

48 **2.1 Defining animal welfare**

49 Although humans have drawn general parallels between themselves and non-human
50 animals for thousands of years, the understanding that animals suffer, and beliefs that
51 humans should not cause undue suffering even in the context of meat production, has been
52 a much more recent phenomenon. Often framed as a response to food shortages after the
53 Second World War, intensive livestock production has been enabled through scientific and
54 technological innovations together with policies that aimed to increase food production. In
55 the UK, the 1964 publication of *Animal Machines* by Ruth Harrison mobilised public interest
56 and led to the inclusion of the positive concept of ‘welfare’, rather than focus merely on
57 cruelty, in legislation referring to the treatment of production animals (Woods 2011).

58 Research efforts into farm animal welfare initially aimed to maximize productivity while
59 addressing the welfare needs of animals in production systems, and focused on the
60 connection between animal biology and an animal’s “welfare state” (Fox 1980). Improved
61 understandings of motivation, cognition and the intricacy of social behaviour has led to a
62 rapid development of animal welfare science in the past 30 years (Broom 2011).

63 Considerations about animals focus on three sets of issues: physical attributes (such as
64 growth and health), mental feelings (pleasure or suffering), and naturalness (environmental
65 or behavioural), or all three combined (Fraser *et al.* 1997; Veisser and Miele 2014). These

66 approaches are characterised in what are termed the ‘Five Freedoms’, namely freedom
67 from injury and disease, hunger and thirst, discomfort, fear and distress, and freedom to
68 perform normal behaviour (Farm Animal Welfare Council 1997, as cited by Appleby 2005),
69 forming the basis of some theories of animal welfare.

70 More recently, definitions of animal welfare have broadened to include other concepts that
71 people value, such as the dignity and integrity of animals (Appleby 2005), positive welfare
72 states (Mellor and Beausoleil 2015), and “quality of life” (Mellor 2016; see also Cornish *et al.*
73 2016 for a more detailed review). However, much of the farm animal welfare research has
74 had a strong emphasis on scientific understandings of welfare and the impact of associated
75 practices on the profitability and the supply chain, rather than on how members of the
76 broader public conceptualise animal welfare. While there is scientific evidence to assist in
77 justifying how some farm animals are raised, some contend that these justifications align
78 more closely with the profitability of the system, rather than with the moral obligations
79 towards animals that many in Western societies believe that we should have. To put it even
80 more bluntly, it could be argued (as it is by activist groups when arguing against industry
81 domination of research efforts) that the aim of much farm animal welfare research has been
82 to identify production environments that have the least negative impacts on the animal,
83 rather than developing optimal environments.

84 As Fraser (2008) states, “our understanding of animal welfare is both values-based and
85 science-based. In this respect, animal welfare is like many other topics of ‘mandated’
86 science...where the tools of science are used within a framework of values”, with
87 acceptance of removal of the animal from its “natural” environment being one of those

88 values. However, the extent to which an animal should be able to have a natural life within
89 an artificial environment is one of the key areas of tension between scientists and the
90 broader community. Broom (2011), Rollin (1990, 1995), Fraser *et al.* (1997), and Fraser
91 (2008) all agree that animals should be able to live reasonably natural lives. However, in
92 defining what counts as 'natural', there is considerable emphasis on the biological
93 functioning of the animal and its interactions with its environment. Broom (2011) also
94 argues that the environment provided to an animal should fulfil the needs of the animal but
95 does not have to be the same as it would be in the wild. On the other hand, as shown in
96 international studies, members of the broader community place much more emphasis on
97 how the animal may feel in its environment, often connecting animals' happiness to their
98 abilities to express their natural behaviours (Vanhonacker *et al.* 2008).

99 2.2 Consumers, citizens and ethical consumerism

100 Individuals can have roles as consumers, who purchase and eat animal products, and as
101 citizens, who voice opinions or participate in activities related to policy or regulation
102 (Coleman *et al.* 2016), and it has been noted that these roles may not be well coordinated
103 with respect to meat production (Verbeke *et al.* 2010). Not all members of society agree
104 that it is appropriate to consume animals or products made from animals, and those who
105 avoid meat and other animal products may not be considered "consumers", however their
106 views and behaviours as citizens are still important to the livestock production sector. Those
107 who do eat animal products can act as both consumers and citizens in different contexts.
108 Ethical consumerism aims to reconcile these behaviours to some extent and typically refers
109 to voluntary food choices made out of concerns for a "moral other" (such as a food animal)
110 because of a consumer's values and beliefs, and may involve choosing certain foods over

111 others because of perceived ethical superiority, or avoiding foods that can be morally
112 problematic (Ankeny 2012). For example, someone who purchases sow stall-free pork
113 because he or she believes it is morally wrong to confine pregnant sows and gilts in pens is
114 participating in an act of ethical consumerism. Ethical consumerism also can be thought of
115 as a political or economic act, aimed at changing or eliminating certain types of practices by
116 consumers “voting with their dollar” (Shaw *et al.* 2006; Willis and Schor 2012) or “voting
117 with their forks” (Parker 2013); an example would be purchasing sow stall-free pork (rather
118 than that produced using other methods) with the aim of using market forces to eliminate
119 the use of sow stalls.

120 Public interest in “ethical” food production and consumption also has been raised in recent
121 years by TV shows featuring celebrity chefs such as Jamie Oliver, popular books including
122 Michael Pollan’s *The Omnivore’s Dilemma* (2006), and films such as *Food, Inc.* (2008), all of
123 which draw attention to avoidance of food produced from intensively-farmed animals. The
124 awareness of ethical claims on food products also has been brought more into the
125 mainstream in recent years by retailers (Hartleib and Jones, 2009), who have
126 “reconceptualise[d] values by promoting particular standards or principles of judgement to
127 apply to food decision-making” (Dixon 2003, p. 37). Major sponsorship of popular television
128 cooking shows by retailers strengthens their location at the centre of popular discourse
129 about food production and consumption (Phillipov 2016b).

130 However, there is an inherent tension between people acting as citizens and consumers
131 which has been noted by some food studies scholars: for instance Johnston (2008) and
132 Guthman and Brown (2016) found that in circumstances where people are encouraged to
133 act as citizens and hence make decisions based on the “greater good”, such as shopping at a

134 Whole Foods Market (Johnston 2008) or posting comments online opposing the use of an
135 agricultural chemical (Guthman and Brown 2016), consumerism still becomes dominant (see
136 also Ankeny 2016 for more on the contrast between food citizens and consumers). Other
137 scholars using a critical animal studies approach (Jenkins and Twine 2014) contend
138 consumers are not as “free” as we might think when making food choices, given dominant
139 sociocultural norms particularly about animal consumption. They also stress that food
140 choices, for instance whether to be vegan or to consume animal products, are moral rather
141 than lifestyle decisions, and hence should not be viewed via the consumer model. As we
142 discuss further in this paper, we agree that there are limitations to focusing solely on
143 consumer behaviours, for instance by utilizing only market mechanisms such as willingness
144 to pay to assess public opinions; other behaviours such as citizen behaviours (including
145 voting and advocacy in relation to relevant issues) are important to examine in order to
146 understand community attitudes to animal production. However, studies that unpack
147 assumptions about why consumers make the choices they do still provide insights into how
148 consumers think about animal production, as we discuss in the next section.

149 3.0 Consumer attitudes to animal welfare and purchasing behaviour

150 Various European, American, and Canadian studies have demonstrated that consumers
151 generally focus on the animal’s resources, notably the access that animals have to unenclosed
152 areas, believing that such settings will lead to happy and healthy animals (Lassen *et al.* 2006;
153 Miele *et al.* 2011; Spooner *et al.* 2014). Consumers also have a strong preference for animals
154 to be reared in natural environments (Miele and Evans 2005; Lusk *et al.* 2007; Boogaard *et*
155 *al.* 2008; Spooner *et al.* 2014), support humane handling practices (Miele and Evans 2005;
156 Boogaard *et al.* 2008; Vanhonacker *et al.* 2008; Boogaard *et al.* 2011), and express concerns

157 related to humane transport and slaughter (Miele and Evans 2005; Spooner *et al.* 2014).
158 Consumers often object to animal suffering or pain associated with modern production
159 methods (Vanhonacker *et al.* 2008; Tuyttens *et al.* 2010; Spooner *et al.* 2014). Economic
160 studies have been used to examine how consumers value products which have animal
161 welfare claims. In economic terms, animal welfare is a credence attribute, that is, it cannot
162 be directly discerned from the product itself by consumers at time of purchase or after
163 consumption, in contrast with experience attributes such as flavour. The motivations for
164 purchasing products with increased animal welfare attributes are associated with consumer
165 socio-demographic characteristics, knowledge of animal welfare issues and trust in
166 information about rearing systems (Toma *et al.* 2012; Gerini *et al.* 2016); for instance, choice
167 experiments in the US revealed a higher willingness to pay for animal welfare attributes
168 verified by a trusted authority such as the USDA (Olynk *et al.* 2010). Providing information
169 about animal welfare may not increase willingness to pay for some products (Elbakidze and
170 Nayga 2012); however European studies indicate that consumers are willing to increase
171 their meat expenditure by about a third in response to a welfare labelling regime
172 (Kehlbacher *et al.* 2012). Despite sector growth, average consumer willingness to pay for
173 cage-free and organic eggs was much less than the estimated price premiums (hence their
174 smaller market share) in a US study by Chang (2010). This research also found that price
175 premiums were higher than the increased costs of production, highlighting the importance
176 of retailer pricing strategies in this market.

177 Although animal welfare concerns are not a strong driver of purchasing behaviour at least
178 compared to other attributes such as taste or health attributes, recent studies have shown
179 that consumers consider animal welfare to be connected to both of these attributes, and so

180 'animal welfare' (as understood by the consumer as opposed to other food system actors)
181 may be an increasingly important driver of purchasing as it is a proxy for taste and health, as
182 we discuss in more detail below. International studies have shown that consumers view high
183 animal welfare standards during production as an indicator that the resulting meat is safe,
184 healthy, better tasting and of high quality (Verbeke *et al.* 2010). A link between food safety
185 and farm animal welfare in terms of antibiotic and growth hormone use in livestock
186 production has been documented (Spooner *et al.* 2014), as well as concerns about
187 genetically-modified products (Lagerkvist and Hess 2011). A Flemish study found that higher
188 animal welfare products were positively related with better product taste, although it was
189 not as strongly related to attributes such as quality, healthiness, safety, and environmental
190 friendliness (Verbeke 2012). A UK survey also found that 78% of participants either agreed
191 or strongly agreed that "animals raised under higher standards of care will produce safer
192 and better-tasting meat" (Lusk *et al.* 2007).

193 Animal welfare labels also can alter the perceived quality of a product, with high animal
194 welfare standards leading to higher quality expectations (Carlucci *et al.* 2009), or attribution
195 of other characteristics such as nutritional value (Anderson & Barrett 2016). Food labels can
196 be thought of as *boundary objects* (Star and Griesemer 1989), which are objects that form
197 an interface between one group and another. Boundary objects such as food labels are
198 interpreted differently across groups and hence are flexible in various ways, but also
199 maintain their integrity, remain recognisable, and serve as interpreters between
200 communities based on some underlying content that remains stable or static (see Bray and
201 Ankeny 2015 for a more in-depth discussion about ethical food labels). Labels clearly are not
202 free-floating bundles of information but arise in a context that is strongly shaped by a

203 variety of factors which may explain the broader associations that consumers may have
204 towards animal products with ethical claims, in particular the attribution of superior
205 characteristics (Lee *et al.* 2013; Anderson and Barrett 2016). However, confusion about the
206 claims made on labels is not just about the public's failure to receive and act on information
207 provided by 'experts', as might be claimed under a deficit model of public understanding.
208 People's eating habits and food choices do not occur in a cultural, social, or historical
209 vacuum but within broader sociocultural, moral, and historical contexts that oftentimes go
210 unrecognised in conventional approaches to these issues. Consumers may wish to make
211 'informed choices' but struggle to do so within the context of real shopping which is limited
212 by time as well as economic and other resources. To focus merely on the need for more
213 education about the 'facts' about various types of food categories is to overlook the context
214 within which food choices occur, and the diverse values that people bring to these choices.

215 4.0 Australian attitudes to meat production

216 There has been comparatively less research in Australia than in Europe or North America
217 aimed at understanding community and consumer attitudes to farm animal welfare;
218 however it is generally understood that Australia lies midway between Europe and the USA
219 in terms of both attitudes and policy responses. Although animal agriculture is important
220 economically, historically, and culturally, Australia is highly urbanized, with 80% of people
221 living in the major cities (Australian Government Department of Infrastructure and Regional
222 Development 2015). There is evidence that our food habits and systems differ in important
223 ways from other countries; we have lower rates of vegetarianism than in other locales and
224 define this category differently (Beardsworth and Keil 1992), have higher average rates of
225 intake of meat, and deep cultural identification with being meat eaters (Ankeny 2008, Chen

226 2016). In addition, Australia's quarantine restrictions on imported animal products for
227 human consumption result in a heavy reliance on domestic production, and the duopoly in
228 our retail sector means retailers play major roles, perhaps greater than producers and
229 consumers, in how food products come to be valued (Dixon 2003). Lastly, because of the
230 relatively short period of time over which European food and fibre production activities have
231 taken place in Australia, and because the species of plants and animals used in agriculture
232 have all been introduced, agricultural activities are not seen as 'part of nature' (Saltzman *et*
233 *al.* 2011) and hence attitudes towards what is 'natural' for animals in production systems
234 may differ than those in other countries.

235 Surveys have shown that Australians believe that farmers do a 'good job' of looking after
236 their animals (Cockfield and Botterill 2012; Worsley *et al.* 2015) and that farmers have the
237 highest level of trust among food systems actors (Henderson *et al.* 2011). However one
238 critique of these studies is that we do not know what understanding of the term 'farmer'
239 employed by the participants in these studies, for instance whether a caged-egg producer is
240 thought of as a 'farmer' in the same way as a beef cattle producer, and whether there are
241 differential levels of trust depending on the type of production system. We do know via
242 popular media and commercial intelligence that Australian consumers are increasingly
243 concerned about animal welfare in Australia's livestock industries. Recent media reports
244 have focused on practices that some consumers believe are unethical: sow stalls, caged
245 hens, bobby calves, and live export of beef cattle and sheep. Heightened attention to these
246 issues may be due in part to recent activist activity focused on these practices, especially in
247 the case of live export (Tiplady *et al.* 2013). Other prominent local campaigns include
248 Animals Australia's "No way to treat a lady" (<http://www.animalsaustralia.org/no-way-to->

249 treat-a-lady) and “Make it possible” (<http://www.makeitpossible.com/>) campaigns featuring
250 local celebrities and television and billboard advertising aimed at caged-hens and intensive
251 housing in the pig industry respectively.

252 A lack of knowledge about animal production practices within the community is often linked
253 with increasing community concern about farm animal welfare, and studies have shown
254 that Australians do have generally poor knowledge of agriculture (Worsley *et al.* 2015).

255 Australians self-report a wide variability of knowledge of farming practices, but often do not
256 perform better than chance when asked factual questions about farming practices (Coleman
257 2010; Coleman *et al.* 2015). While these previous studies provide insight on general
258 attitudes and knowledge regarding animal welfare, they do not give us an understanding of
259 the impact of attitudes and knowledge on actual purchasing behaviours or on community
260 behaviours that may exert regulatory pressure on animal production practices.

261 To date, there have been few studies exploring willingness to pay for products with welfare
262 claims in Australia; Taylor and Signal (2009) is one exception, but this research uses self-
263 reporting within a survey rather than behavioural economics methods, and thus faces the
264 usual limitations presented by reliance on self-reporting including a tendency to promote
265 positive bias toward issues presented as of concern. This research revealed that only 6% of
266 participants were not concerned about farm animal welfare, and 37% described themselves
267 as ‘concerned’; 34% would pay 5 to 10% more for products made in ways that ensured the
268 Five Freedoms (Taylor and Signal 2009). Interestingly, self-rated knowledge did not increase
269 willingness to pay among rural participants, but did among those from metropolitan areas,
270 suggesting these groups of consumers are working with different types of knowledge, or

271 that the knowledge which they have has led to different perspectives and hence diverse
272 conclusions.

273 5.0 Why are consumers motivated to purchase products with animal welfare claims?

274 Although the research discussed so far in this paper has revealed important findings for our
275 understanding of attitudes to farm animal welfare and willingness to pay for products with
276 welfare claims, almost all of it has assumed that there are shared understandings between
277 the researchers and the research participants about what animal welfare is, that is, that it is
278 related to animal well-being, similar to how it is defined in the Five Freedoms. The findings
279 of Taylor and Signal (2009), Coleman *et al.* (2016), and others highlight that consumers have
280 different understandings of animal production and animal welfare, yet the motivations and
281 reasonings behind *why* consumers may be concerned about animal welfare have not been
282 critiqued and have been broadly interpreted as concern for animal well-being in production
283 systems. Similarly, a willingness to pay for products with welfare claims is assumed to be
284 motivated by desires on the part of consumers to improve animal well-being. Thus industry
285 efforts to address well-being may be insufficient unless there are further efforts to
286 understand how consumers think about animal welfare in relation to meat production.

287 As part of a much larger study examining ethical consumption, we recently explored why
288 consumers purchased free-range eggs (see Bray and Ankeny 2017 for a full description of
289 this work). For this research, we conducted interviews and focus groups with over 70
290 Australians from diverse backgrounds in a qualitative investigation of their purchasing
291 behaviours, and in particular whether they made any purchases that they viewed as
292 “ethical”. We asked participants explicitly whether they purchased food with animal welfare

293 claim; free-range or cage-free eggs were the most commonly mentioned products. However
294 often those who had preferences for free-range eggs did not prefer meat with animal
295 welfare claims. Our participants suggested reasons for this apparent inconsistency, namely
296 that the labelling on egg products was larger, that they were easier to find in the
297 supermarket, but perhaps most importantly that the price difference as compared to the
298 conventional product was manageable within their budgets whereas meat was already an
299 expensive item and therefore the premium for welfare claims made it “too expensive”.

300 When participants talked about free-range meats, it was more common for them to
301 mention chicken than pork, and there was little discussion of beef and sheep meat. One of
302 the main issues that people raised in connection with meat production was confinement,
303 revealing their perceptions that it is common practice for pigs and meat-birds to be
304 confined, which they do not think is the case with other meat animals. Although efforts on
305 behalf of retailers to credential their products may be having one of their desired effects,
306 namely to reassure their customers that they are concerned about animal welfare,
307 participants in our research were confused about some of the claims, for example confusing
308 sow stalls with farrowing crates.

309 Confinement was not an issue for our participants for the reasons that most animal
310 scientists and even possibly producers would expect. Confinement was seen as preventing
311 animals from exhibiting natural behaviours (i.e., moving around) which in turn was thought
312 to be important because it enabled animals to access their ‘natural’ diets. In contrast,
313 participants described the diets of housed animals as ‘unknown’. It may be the case that
314 some of our participants thought that access to a ‘natural’ (in their words) diet is a welfare

315 issue, in other words that certain foodstuffs may reduce an animal's wellbeing or even make
316 animals ill. However, we suggest that it is more likely that our participants felt that an
317 'unknown' animal diet increased the risk associated with the resulting food products.
318 Specific examples provided by participants that reinforce these fears include grain that may
319 have been sprayed with pesticides, been genetically modified, or contain 'unknown'
320 chemical additives (presumably referring to antibiotics or 'hormones' that many think are
321 used in animal food production), all of which were thought to be negative and to decrease
322 the safety of the resulting product. In addition, several participants described positive
323 effects of a 'natural' diet which in turn improve the quality of the product: animals that have
324 natural diets somehow naturally express that in the resulting product which is in turn of
325 higher quality.

326 Although further work is needed to understand what the community thinks of as a 'natural'
327 diet for pigs, there are three important implications for these findings. First, although a
328 preference for products with welfare claims may appear to be an act of 'ethical
329 consumption', it appears instead that welfare claims are being used by consumers as proxies
330 for quality in terms of both nutrition and safety. This finding is critical as it changes the
331 category of behaviour from one that is 'ethical' and oriented towards the moral other (e.g.,
332 the animal whose higher welfare is desired or even the environment which might be
333 affected by production practices), to one that is motivated by the needs and desires of
334 oneself and one's family. In short, it may well be the case that preferences for animal
335 welfare products are not based on what we typically consider to be 'ethical' considerations.

336 Second, these findings force us to revisit research that has identified preferences for welfare
337 claims, especially willingness to pay (WTP) studies, where it is concluded that people will
338 pay more for products from production systems with better animal welfare, and where
339 animal welfare is understood by the researchers to relate to a 'scientific definition' (and may
340 not be analysed in additional detail with the participants). If welfare is a proxy for quality,
341 then the WTP for animal welfare actually may be a WTP for a better quality product. If
342 consumer perceptions of superior sensory characteristics of products with welfare claims
343 are correct, then animal welfare should not continue to be considered to be a credence
344 value. In other words, consumers believe that it *can* be directly discerned from the product
345 itself based on appearance at time of purchase or sensory characteristics detected during
346 consumption.

347 **Lastly, to be precise, our work does *not* show that people do not consider the**
348 **welfare of animals when they make their purchases or engage in citizen behaviour**
349 **related to animal welfare, but instead that consumers think about animal welfare**
350 **in much broader and holistic terms than simply defining it as animal well-being,**
351 **and in particular that they often associate animal well-being closely with access to**
352 **a 'natural' diet. They also feel very strongly that better welfare is connected to**
353 **improved product quality and safety, a finding which echoes those found in**
354 **international studies mentioned previously.**6.0 How do Australians talk about meat
355 **production with their children**

356 So far in this paper, we have emphasised that attitudes to and understandings of animal
357 welfare differ among different members of the community, and that these attitudes

358 typically do not relate specifically to ‘factual knowledge’ of animal production systems. In
359 order to understand how attitudes toward meat production are socially and culturally
360 constructed, we explored how Australian families talk about meat production with their
361 children (see Bray *et al.* 2016 for a full description of this work). Talking about animal death
362 is generally considered to be a sensitive topic in countries such as Australia, especially in
363 front of children, and until very recently, there were few educational programs aimed at
364 children that deal expressly with meat production. We hypothesised, based on tracking
365 discussions on social media, that this might also be a difficult subject for parents in meat-
366 consuming families to discuss because of fears that their children might become emotional,
367 or that it may seem to contradict messages about caring for animals. Parents, particularly
368 those in urban areas, also may feel that they lack knowledge of animal production. We also
369 could find no information about what Australian parents thought was an appropriate age for
370 children to learn about the animal origins of meat, or whether certain activities such as
371 attending agricultural shows were important for teaching children about meat production.
372 To address these questions, we surveyed 225 primary carers of children from Australian
373 households where meat was consumed. Most of respondents (93%) had talked with their
374 children about meat production and 60% felt that these conversations were appropriate
375 when the children were five or younger. Most conversations occurred when preparing (67%)
376 or eating (65%) meals. Parents stressed that it was important from an early age for children
377 to know where their food comes from. They also noted that if children were older when
378 they were told where meat comes from, they were more likely to become upset. There
379 were some differences in the ways that women and men thought about meat eating; for
380 instance, women were more likely to agree that children should make conscious decisions

381 about eating meat. In addition, women were more likely than men to be understanding if
382 their children stopped eating meat and more likely to feel conflicted themselves about
383 eating meat. Men were more likely to believe that meat should be eaten as part of a healthy
384 diet, and that children should eat what is put in front of them without question. As the links
385 with meat and masculinity have been well documented, the gendered aspects of our
386 findings are perhaps not surprising. More generally, women have greater general concerns
387 about animal welfare and are more likely to avoid meat than men.

388 We also found that those who lived in cities found conversations about food animals and
389 meat more difficult than those who lived in rural areas. Families in rural areas did not
390 perceive these types of conversations to be difficult or to be avoided and believed that
391 children should be shown aspects of animal food production practices. People who lived in
392 urban areas were more likely to feel that they lacked some of the necessary knowledge to
393 talk about meat production and had preferences for avoiding these conversations.

394 Most of the participants provided details about how their children learned about the origins
395 of meat. Some (particularly those who lived in urban areas) described cases where children
396 became upset and chose not to eat meat for a period of time. In contrast, parents of rural
397 children noted that knowing about the origins of meat was part of their day-to-day lives,
398 and some were directly involved in raising farm animals for food. For some rural
399 participants, their roles in animal production may be linked to their attitudes, but may also
400 be connected to other rural values. Most participants, be they rural or urban parents,
401 thought that it was critical to communicate a sense of respect to their children, namely that

402 animals should be treated well on farms and killed humanely, and that the effort that goes
403 into producing meat should be recognised.

404 Our research also found that the home environment is typically where children first learn
405 about food production, including meat. In addition, parents talk to children about meat in
406 ways that reflect their own values about meat production. We contend that one of the most
407 important findings was the value of respect stressed by most study respondents, which we
408 believe is an encouraging starting point for a broader conversation about the future of
409 ethical, sustainable, and affordable food based on shared values.

410 7.0 Moving forward – why education and information are insufficient

411 Knowledge and trust are clearly both important factors for consumers when they choose
412 their food. As we have shown, ‘farmers’ enjoy high levels of trust in Australia, and that this
413 trust is not associated with a high level of technical knowledge about food production. In
414 the past, communication efforts to encourage the community to accept controversial food
415 production methods, for example the production of genetically-modified crops, have
416 concentrated on increasing the community’s knowledge about the science behind such
417 methods. This approach to science communication is termed ‘the deficit model’ and has
418 largely been rejected by scholars in the science communication/public understanding of
419 science as it is both based on flawed assumptions and is highly ineffective, although it
420 persists as a dominant mode of communication (Simis *et al.* 2016). Hence while it is
421 tempting to treat worries about animal welfare practices as based on a deficit of knowledge
422 about current management practices that maximise welfare (at least in the opinions of

423 scientists and arguably producers), it is unclear that increasing awareness and knowledge of
424 these practices will create more community acceptance or change consumer behaviours.

425 We argue that trust is more important than knowledge or information. While it is difficult
426 to gauge community sentiments towards pig production for the reasons we have outlined
427 above, based on the available literature in related domains, it is likely that concerns for
428 animal welfare do not regularly influence the food choices made by the majority of
429 consumers. Instead they rely on what is termed 'habitual trust' (Bildtgard 2008), that is, the
430 assumption that events occurring in the world will continue in the same way as they have
431 before; as long as this assumption is not betrayed, trust will be more or less habitual and
432 automatic. Habitual trust is very different from 'reflexive trust', where a person
433 "consciously weighs different values and corresponding forms of knowledge against each
434 other, while trying to determine which systems and actors to trust" (Bildtgard 2008, p118).
435 Knowledge becomes important when and if people become aware that practices do not
436 reflect what they *thought* occurred in practice; if the reality is more negative than
437 perceptions, they can feel that their trust has been betrayed. This betrayal of trust is
438 increasingly being described as a loss of a particular industry or sector's 'social licence to
439 operate' (Martin and Shepheard 2011).

440 Maintaining or building trust is key to community and consumer support for animal
441 production. We know that shared values are more important for the formation of opinions,
442 well ahead of technical knowledge (Sapp *et al.* 2009), and so we recommend that industry
443 communication efforts must be based on shared values. However, it is dangerous to assume
444 that just by 'talking' about shared values, an industry will be able to convince the

445 community that what they are doing is 'right'. Engagement does not work if it only occurs in
446 one direction; dialogue and a preparedness to change has to exist on both sides . A clear
447 picture of the values and attitudes of both parties needs to be at the core in order to foster
448 any effective dialogue.

449 Consumer and citizen behaviours are both complex. Understanding the physiological basis
450 of animal welfare has been an area of considerable international and interdisciplinary
451 research effort for decades, and at least a similar effort will be required to determine what
452 society members feel are appropriate ways to raise animals for meat. Researchers from
453 various fields such as psychology, economics, media studies, sociology, and science
454 communication can help to reveal some parts of the picture using their own particular
455 lenses, but it will take sustained and coordinated investment across disciplines to ensure
456 alignment in attitudes to and understanding of animal welfare between meat producers and
457 the broader public.

458 [References](#)

459 Anderson EC, Barrett LF (2016) Affective beliefs influence the experience of eating meat.

460 *PLoS ONE*, **11**(8), e0160424. doi:10.1371/journal.pone.0160424.

461 Ankeny RA (2008) The Moral Economy of Red Meat in Australia. In 'Proceedings of the

462 Oxford Symposium on Food and Cookery 2007.' (Ed. SR Friedland.) pp. 20-28.

463 (Prospect Books: Blackawton, Totnes)

464 Ankeny RA (2012) Food and Ethical Consumption. In 'The Oxford Handbook of Food History.'

465 (Ed. JM Pilcher.) pp. 461-480. (Oxford University Press: New York)

466 Ankeny RA (2016) Inviting everyone to the table: strategies for more effective and

467 legitimate food policy via deliberative approaches. *Journal of Social Philosophy* **47**,
468 10-24

469 Appleby M (2005) The relationship between food prices and animal welfare. *Journal of*
470 *Animal Science* **83**, 9-12.

471 Australian Government Department of Infrastructure and Regional Development. (2015).
472 State of Australian cities 2014–2015: Progress in Australian regions. Retrieved from
473 https://infrastructure.gov.au/infrastructure/pab/soac/files/2015_SoAC_full_report.pdf.

474 Beardsworth A, Keil T (1992) The vegetarian option: Varieties, conversions, motives and
475 careers. *Sociological Review* **40**, 253-293.

476 Boogaard BK, Oosting SJ, Bock BB (2006) Elements of societal perception of farm animal
477 welfare: a quantitative study in The Netherlands. *Livestock Science* **104**, 13-22.

478 Boogaard, BK, Oosting, SJ, Bock, BB (2008) Defining sustainability as a socio-cultural
479 concept: citizen panels visiting dairy farms in the Netherlands. *Livestock Science* 24-
480 33.

481 Boogaard, BK, Boekhorst, LJS, Oosting, SJ, Sorensen, JT (2011) Social Acceptance of Dairy
482 Farming: The Ambivalence Between the Two Faces of Modernity. *Livestock Science*
483 **140**, 189-200.

484 Boogaard B, Oosting S, Bock B, Wiskerke J (2011) The sociocultural sustainability of livestock
485 farming: an inquiry into dairy farming. *Animal* **5**, 1458-1466.

486 Bray HJ, Ankeny RA (2017, forthcoming) "Happier chickens lay tastier eggs": Motivations for
487 buying free-range eggs in Australia, *Anthrozoös*

488 Bray HJ, Ankeny RA (2015). What do food labels teach people about food ethics? In Elaine
489 Swan & Rick Flowers (Eds.), *Food Pedagogies* (pp. 185-200). London: Ashgate.

490 Bray HJ, Zambrano S, Chur-Hansen A, Ankeny RA (2016) Not appropriate dinner table
491 conversation? Talking to children about meat production, *Appetite* **100**, 1-9

492 Brom F (2000) Food, consumer concerns, and trust: food ethics for a globalising market.
493 *Journal of Agricultural and Environmental Ethics* **12**, 127-139.

494 Broom D (2011) A history of animal welfare science. *Acta Biotheoretica* **59**, 121-137.

495 Carlucci A, Monteleone E, Braghieri A, Napolitano F (2009) Mapping the effect of
496 information about animal welfare on consumer liking and willingness to pay for
497 yogurt. *Journal of Sensory Studies* **24**, 74-82.

498 Chang J, Lusk J, Norwood F (2010) The price of happy hens: a hedonic analysis of retail egg
499 prices. *Journal of Agricultural Resource Economics* **35**, 406-423.

500 Chen P (2016). Animal Welfare Policy in Australia: Pace, Race, and Shelf-space. In Robert
501 Garner and Siobhan OSullivan (Eds.), *The Political Turn in Animal Ethics*, (pp. 175-
502 190). London: Rowman & Littlefield International

503 Cockfield G, Botterill LC (2012) Signs of Countrymindedness:A Survey of Attitudes to Rural
504 Industries and People. *Australian Journal of Political Science* **47**, 609-622.

505 Cornish A, Raubenheimer D, McGreevy P (2016) What we know about the public's level of
506 concern for farm animal welfare in food production in developed countries. *Animals*
507 **6**(11), 74.

508 Coleman GJ (2010) Educating the Public: Information of Persuasion? *Journal of Veterinary*
509 *Medical Education* **37**, 74-82.

510 Coleman GJ, Jongman E, Greenfield L, Hemsworth P (2016). Farmer and public
511 attitudes toward lamb finishing systems. *Journal of Applied Animal Welfare Science*
512 **19**, 198-209

513 Coleman GJ, McGregor M, Hemsworth PH, Boyce J, Dowling S (2003) The relationship
514 between beliefs, attitudes and observed behaviors of abattoir personnel in the pig
515 industry. *Appl. Anim. Behav. Sci.* **82**, 189-200.

516 Coleman GJ, Rohlf V, Toukhsati, S and Blache D (2016) Relevance of public attitudes to
517 animal welfare for the pork industry. Animal Production 2016. 4-7 July, Adelaide,
518 Australia, 68

519 Dixon J (2003) Authority, power and value in contemporary industrial food systems.
520 *International Journal of Sociology, Agriculture and Food* **11**, 31-39.

521 Dockè, A, Kling-Eveillar, F (2006) Farmers' and advisers' representations of animals and
522 animal welfare. *Livestock Science* **103**, 243-249.

523 Elbakidze L, Nayga R (2012) The effects of information on willingness to pay for animal
524 welfare in dairy production: application o non hypothetical valuation mechanisms.
525 *Journal of Dairy Science* **95**, 1099-1107.

526 FAWC (1997) Report on the Welfare of Laying Hens. Farm Animal Welfare Coucil, Tolworth,
527 U.K.

528 Fox M (1980) 'Returning to Eden: Animal Rights and Human Responsibility.' (Viking: New
529 York)

530 Fraser D, Weary D, Pajor E, Milligan B (1997) A Scientific Conception of Animal Welfare that
531 Reflects Ethical Concerns. *Animal Welfare* **6**, 187-205.

532 Fraser D (2008) Understanding animal welfare. *Acta Veterinaria Scandinavica* **50**, 1-7.

533 Frewer LJ, Kole A, van de Kroon SMA, de Lauwere C (2005) Consumer attitudes towards the
534 development of animal-friendly husbandry practices. *Journal of Agricultural and*
535 *Environmental Ethics* **18**, 345-367.

536 Gerini F, Alfnes F, Schjøll (2016) Organic- and animal welfare-labelled eggs: competing for
537 the same consumers? *Journal of Agricultural Economics* **67**, 471-490

538 Guthman J, Brown S. (2016) I will never eat another strawberry again: the biopolitics of
539 consumer-citizenship in the fight against methyl iodide in California. *Agriculture and*
540 *Human Values* **33**, 575–585

541 Hansson H, Lagerkvist C (2012) Measuring farmers' attitude to animal welfare and health.
542 *British Food Journal* **114**, 556-571.

543 Harrison R (1964) 'Animal Machines'(CABI: Oxfordshire, UK)

544 Hemsworth P, Barnett J, Coleman G (2009) The integration of human-animal relations into
545 animal welfare monitoring schemes. *Animal Welfare* **18**, 335-345.

546 Henderson J, Coveney J, Ward PR, Taylor AW (2011) Farmers are the most trusted part of
547 the Australian food chain: results from a national survey of consumers. *Australian*
548 *and New Zealand Journal of Public Health* **35**, 319-324.

549 Jenkins S, Twine R. (2014) On the limits of food autonomy: Rethinking choice and privacy.
550 In *The Rise of Critical Animal Studies. From the Margins to the Centre*, 225-240, eds.
551 Taylor, N. and Twine, R. Abingdon: Routledge.

552 Johnston J. (2008) The citizen-consumer hybrid: ideological tensions and the case of Whole
553 Foods Market. *Theory and Society* **37**, 229–270.

554 Kehlbacher A, Bennett R, Balcombe K (2012) Measuring the consumer benefits of improving
555 farm animal welfare to inform welfare labelling. *Food Policy* **37**, 627-633.

556 Kendall HA, Lobao LM, Sharp JS (2006) Public Concern with Animal Well-Being: Place, Social
557 Structural Location, and Individual Experience. *Rural Sociology* **71**, 399-428.

558 Kenner R, Pearce R, Eric S, Melissa R, William P, 2009. Food, Inc. Magnolia Home
559 Entertainment, Los Angeles, CA.

560 Lagerkvist CJ, Hess S (2011) A meta-analysis of consumer willingness to pay for farm animal
561 welfare. *European Review of Agricultural Economics* **38**, 55-78.

562 Lassen J, Sandoe P, Forkman B (2006) Happy pigs are dirty! - conflicting perspective of
563 animal welfare. *Livestock Science* **103**, 221-230.

564 Lee WJ, Shimizu M Kniffin KM, Wansink B (2013). You taste what you see: Do organic labels
565 bias taste perceptions? *Food Quality and Preference*, **29**, 33–39.

566 Lund V (2006) Natural living- a precondition for animal welfare in organic farming. *Livestock*
567 *Science* **100**, 71-83.

568 Lusk J, Norwood B, Prickett R (2007). Consumers share views on farm animal welfare: survey
569 looks into what consumers think about various farm animal welfare issues.
570 Feedstuffs.

571 Martin P, Shepherd M (2011) What is meant by the social licence? In *Defending the Social*
572 *Licence of Farming: Issues, Challenges and New Directions for Agriculture*, edited by J
573 Williams & P Martin, pp. 3–11. Collingwood: CSIRO Publishing.

574 Mellor DJ (2016) Updating animal welfare thinking: Moving beyond the “Five Freedoms”
575 towards “A Life Worth Living”. *Animals* **6**, 21

576 Mellor DJ, Beausoleil NJ (2015) Extending the ‘Five Domains’ model for animal welfare
577 assessment to incorporate positive welfare states. *Animal Welfare* **24**, 241–253.

578 Miele M, Evans A (2005) European consumers view about farm animal welfare. In 'Welfare
579 Quality Conference: Science and Society Improving Animal Welfare. Brussels,
580 Belgium'. (Ed. A Butterworth) pp. 13-29. (Welfare Quality Project:

581 Miele M, Veissier I, Evans A, Botreau R (2011) Animal welfare: establishing a dialogue
582 between science and society. *Animal Welfare* **20**, 103-117.

583 Olynk N, Tonsor G, Wolf C (2010) Consumer willingness to pay for livestock credence
584 attribute claim verification. *Journal of Agricultural Resource Economics* **35**, 261-280.

585 Parker C (2013) Voting with your fork? Industrial free-range eggs and the regulatory
586 construction of consumer choice. *ANNALS American Academy of Political and Social*
587 *Science* **649** 52-73.

588 Parker C, Brunswick C, Kotey J (2013) The Happy Hen on Your Supermarket Shelf. What
589 Choice Does Industrial Strength Free-Range Represent for Consumers? *Bioethical*
590 *Inquiry* **10**, 165-186.

591 Phillipov M (2016a) Escaping to the country: media, nostalgia, and the new food industries,
592 *Popular Communication* **14**(2), 111-122.

593 Phillipov M (2016b) 'Helping Australia grow': supermarkets, television cooking shows, and
594 the strategic manufacture of consumer trust, *Agriculture and Human Values* **33**(3),
595 587-596.

596 Pollan M (2006) 'The omnivore's dilemma: A natural history of four meals.' (Penguin: New
597 York)

598 Rollin B (1990) Animal Welfare, Animal Rights and Agriculture. *Journal of Animal Science* **68**,
599 3456-3461.

600 Rollin BE (1995) Farm animal welfare: social bioethical and research issues. (Ames: Iowa
601 State University Press)

602 Saltzman K, Head L, Stenseke M (2011) Do cows belong in nature? The cultural basis of
603 agriculture in Sweden and Australia. *Journal of Rural Studies*, **27**, 54-62.

604 Sapp SG et al (2009) Consumer trust in the US food system: An examination of the recreancy
605 theorem. *Rural Sociol* 74: 525–45

606 Shaw D, Newholm T, Dickinson R (2006) Consumption as voting: an exploration of consumer
607 empowerment. *European Journal of Marketing* **40**, 1049-1067.

608 Simis MJ, Madden H, Cacciatore MA, Yeo SK (2016) The lure of rationality: Why does the
609 deficit model persist in science communication? *Public Understanding of Science*, **25**
610 (4), 400-414.

611 Spooner J, Schuppli C, Fraser D (2014) Attitudes of Canadian citizens toward farm animal
612 welfare: a qualitative study. *Livestock Science* **163**, 150-158.

613 Taylor N, Signal TD (2009) Willingness to Pay: Australian Consumers and "On the Farm"
614 Welfare. *Journal of Applied Animal Welfare Science* **12**, 345-359

615 Te Velde H, Aarts N, Van Woerkum C (2002) Dealing with Ambivalence: Farmers' and
616 Consumers' perceptions of animal welfare in livestock breeding. *Journal of*
617 *Agricultural and Environmental Ethics* **15**, 203-219.

618 Tiplady CM, Walsh D-AB, Phillips CJC (2013) Public response to media coverage of animal
619 welfare. *Journal of Agricultural and Environmental Ethics* **26**, 869-885.

620 Toma L, Stott AW, Revoredo-Giha C, Kupieh-Teahan B. (2012) Consumers and animal
621 welfare. A comparison between European Union countries. *Appetite* **58**, 597-607.

622 Tonsor GT, Olynk NJ (2011) Impacts of animal well-being and welfare media on meat
623 demand. *Journal of Agricultural Economics* **62**, 59-72.

624 Tuyttens FAM, Vanhonacker F, Van Poucke E, Verbeke W (2010) Quantitative verification
625 of the correspondence between the Welfare Quality® operational definition of farm

626 animal welfare and the opinion of Flemish farmers, citizens and vegetarians.
627 *Livestock Science* **131**, 108-114

628 Vanhonacker F, Verbeke W, Van Poucke E, Tuyttens FAM (2007) Segmentation based on
629 consumers' perceived importance and attitude towards farm animal welfare.
630 *International Journal of Sociology of Food and Agriculture* **15**, 91-107.

631 Vanhonacker F, Verbeke W, Van Poucke E, Tuyttens FAM (2008) Do citizens and farmers
632 interpret the concept of farm animal welfare differently? *Livestock Science* **116**, 126-
633 136.

634 Veissier I, Miele M (2014) Animal welfare: towards transdisciplinarity - the European
635 experience. *Animal Production Science* **54**, 1119-1129.

636 Verbeke W (2012) 'Citizen and consumer attitudes towards animal welfare in livestock
637 production. Presentation at EU Animal Welfare Conference, Brussels, 29 February
638 2012.' Available at
639 [http://ec.europa.eu/food/animal/welfare/seminars/docs/290212_d1s2_1_wim_ver](http://ec.europa.eu/food/animal/welfare/seminars/docs/290212_d1s2_1_wim_verbeke.pdf)
640 [beke.pdf](http://ec.europa.eu/food/animal/welfare/seminars/docs/290212_d1s2_1_wim_verbeke.pdf) [Accessed 14th April].

641 Verbeke W, Perez-Cueto FJ, de Barcellos MD, Krystallis A, Grunert KG (2010) European
642 citizen and consumer attitudes and preferences regarding beef and pork. *Meat*
643 *Science* **84**, 284-292.

644 Waiblinger S, Menke C, Coleman G (2002) The relationship between attitudes, personal
645 characteristics and behaviour of stockpeople and subsequent behaviour and
646 production of dairy cows. *Applied Animal Behaviour Science* **79**, 195-219.

647 Willis MM, Schor JB (2012) Does Changing a Light Bulb Lead to Changing the World? Political
648 Action and the Conscious Consumer. *The ANNALS of the American Academy of*
649 *Political and Social Science* **644**, 160-190.

650 Woods A (2011) From cruelty to welfare: the emergence of farm animal welfare in Britain,
651 1964-71. *Endeavour* **36**, 14-22.

652 Worsley A, Wang W, Ridley S (2015) Australian adults knowledge of Australian agriculture.
653 *British Food Journal* **117**, 400-411.

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